CLAIMS

What is claimed is:

1. Apparatus comprising:

a variable length decoder configured to variable length decode compressed information and to generate a variable length decoded data block; and

an inverse quantization module coupled to the variable length decoder, the inverse quantization module configured to inverse quantize the variable length decoded data block using a quantization parameter selected based on block size assignment information and address of data within the data block.

2. The apparatus of claim 1, wherein the inverse quantization module is configured to select the quantization parameter.

3. The apparatus of claim 2, wherein the inverse quantization module comprises a parameter selection module configured to select the quantization parameter.

4. The apparatus of claim 3, wherein the inverse quantization module further comprises an address decoder coupled to the parameter selection module, the address decoder configured to decode the address of the data within the data block, and wherein

the quantization parameter is selected based on the block size assignment information and the decoded address of the data.

5. The apparatus of claim 1, further comprising a parameter selection module coupled to the inverse quantization module, the parameter selection module configured to select the quantization parameter.

6. The apparatus of claim 1, further comprising an address decoder coupled to the variable length decoder, the address decoder configured to decode the address of the data within the data block, and wherein

the quantization parameter is selected based on the block size assignment information and the decoded address of the data.

7. The apparatus of claim 1, further comprising an inverse adaptive block size discrete cosine transform module coupled to the inverse quantization module, the inverse adaptive block size discrete cosine transform module configured to recover original data from the inverse quantized data block.

8. The apparatus of claim 1, wherein the quantization parameter is a Q_step.

9. The apparatus of claim 1, wherein the quantization parameter comprises a Q_step and a frequency weight mask table.

10. The apparatus of claim 9, wherein the inverse quantization module comprises:

a first multiplier configured to multiply the variable length decoded data by the selected Q_step and generating a first multiplication value; and

a second multiplier coupled to the first multiplier, the second multiplier configured to multiply the first multiplication value by a value from the selected frequency weight mask table.

11. A method comprising:

variable length decoding compressed information to generate a variable length decoded data block;

selecting a quantization parameter based on block size assignment information and address of data within the data block; and

inverse quantizing the variable length decoded data block using the selected quantization parameter.

12. The method of claim 11, further comprising decoding the address of the data within the data block and selecting the quantization parameter based on the block size assignment information and the decoded address of the data.

13. The method of claim 12, wherein decoding the address of the data comprises decoding the address of the data into Y and X indices based on a Y and X index system.

14. The method of claim 11, further comprising inverse adaptive block size discrete cosine transforming the inverse quantized data block to recover original data.

15. Apparatus comprising:

means for variable length decoding compressed information to generate a variable length decoded data block;

means for selecting a quantization parameter based on block size assignment information and address of data within the data block; and

means for inverse quantizing the variable length decoded data block using the selected quantization parameter.

16. The apparatus of claim 15, further comprising means for decoding the address of the data within the data block, and wherein

the means for selecting the quantization parameter selects the quantization parameter based on the block size assignment information and the decoded address of the data.

17. The apparatus of claim 16, wherein the means for decoding decodes the data into Y and X indices based on a Y and X index system.

18. The apparatus of claim 15, further comprising means for inverse adaptive block size discrete cosine transforming the inverse quantized data block to recover original data.

19. The apparatus of claim 15, wherein the means for selecting the quantization parameter selects a Q_step.

20. The apparatus of claim 19, wherein the means for selecting the quantization parameter selects a frequency weight mask table.

21. The apparatus of claim 20, wherein the means for inverse quantizing the variable length decode data block comprises:

first multiplication means for multiplying the variable length decoded data by the selected Q_step and generating a first multiplication value; and

second multiplication means for multiplying the first multiplication value by a value from the selected frequency weight mask table.

22. An instruction loaded on a machine readable medium comprising:

first set of instructions to variable length decode compressed information to generate a variable length decoded data block;

second set of instructions to select a quantization parameter based on block size assignment information and address of data within the data block; and

third set of instructions to inverse quantize the variable length decoded data block using the selected quantization parameter.

23. The instruction of claim 22, further comprising fourth set of instructions to decode the address of the data within the data block, and wherein

the second set of instructions selects the quantization parameter based on the block size assignment information and the decoded address of the data.

24. The instruction of claim 23, wherein the fourth set of instructions comprises instructions to decode the address into Y and X indices based on a Y and X index system.

25. Apparatus comprising:

a projector configured to display decompressed image information;

a sound system configured to play decompressed audio information; and

a decoder coupled to at least the projector, the decoder comprising:

an image decompressor coupled to the projector, the image decompressor configured to decompress compressed image information into the decompressed image information based on block size assignment information and address of data within a data block; and

an audio decompressor coupled to the sound system, the audio decompressor configured to decompress compressed audio information into the decompressed audio information.

26. The apparatus of claim 25, wherein the image decompressor comprises:

a variable length decoder configured to variable length decode the compressed information and to generate a variable length decoded data block;

an inverse quantization module coupled to the variable length decoder, the inverse quantization module configured to inverse quantize the variable length decoded data block using a quantization parameter selected based on the block size assignment information and the address of data within the data block.

an inverse adaptive block size discrete cosine transform module coupled to the inverse quantization module, the inverse adaptive block size discrete cosine transform module configured to inverse discrete cosine transform the inverse quantized data into the decompressed image information.

27. The apparatus of claim 26, wherein the inverse quantization module is configured to select the quantization parameter.

28. The apparatus of claim 26, further comprising a parameter selection module coupled to the inverse quantization module, the parameter selection module configured to select the quantization parameter.

29. The apparatus of claim 26, further comprising an address decoder coupled to the variable length decoder, the address decoder configured to decode the address of the data within the data block, and wherein,

the quantization parameter is selected based on the block size assignment information and the decoded address of the data.

30. The apparatus of claim 29, wherein the address decoder decodes the address of the data into Y and X indices based on a Y and X index system.

31. Apparatus comprising:

means for displaying decompressed image information;

means for playing decompressed audio information;

means for decompressing compressed image information into the decompressed image information based on block size assignment information and address of data within a data block; and

means for decompressing compressed audio information into the decompressed audio information.

32. The apparatus of claim 31, wherein the means for decompressing compressed image information comprises:

means for variable length decoding the compressed information to generate variable length decoded data block;

means for selecting a quantization parameter based on the block size assignment information and the address of data within the data block;

means for inverse quantizing the variable length decoded data block using the selected quantization parameter; and

means for inverse discrete cosine transforming the inverse quantized data into the decompressed image information.

33. The apparatus of claim 32, wherein the means for decompressing the compressed image information further comprises means for decoding the address of the data within the data block, and wherein

the means for selecting the quantization parameter selects the quantization parameter based on the block size assignment information and the decoded address of the data.

34. The apparatus of claim 33, wherein the means for decoding decodes the address of the data into Y and X indices based on a Y and X index system.

35. A method comprising:

decoding an address of a data block into Y and X indices based on a Y and X index system;

receiving block size assignment information; and

selecting an appropriate quantization parameter based on the block size assignment information and the Y and X indices.

36. The method of claim 35, wherein the data block is a 16x16 data block and wherein the block size assignment information comprises:

a first bit indicating whether the 16x16 data block is divided into 8x8 sub-blocks;

second bits if the first bit indicates that the 16x16 is divided into 8x8 sub-blocks, each second bit indicating whether a corresponding 8x8 sub-block is divided into 4x4 sub-blocks; and

third bits if at least one second bit indicates that the corresponding 8x8 sub-block is divided into 4x4 sub-blocks; each third bit indicating whether a corresponding 4x4 sub-block is divided into 2x2 sub-blocks.

37. The method of claim 36, wherein selecting the appropriate quantization parameter comprises:

determining a variable value based on the block size assignment information and Y and X indices; and

selecting the quantization parameter based on the determined variable value.

38. The method of claim 37, wherein determining the variable value comprises:

determining a first value of the variable value as the first bit of the block size assignment information;

selecting one of the second bits of the block size assignment information as a second value of the variable value based on the Y and X indices, if the block size assignment information comprises second bits, and otherwise selecting a default value as the second value of the variable value; and

selecting one of the third bits of the block size assignment information as a third value of the variable value based on the Y and X indices, if the block size assignment information comprises third bits, and otherwise selecting a default value as the third value of the variable value.

39. The method of claim 36, wherein selecting the appropriate quantization parameter comprises:

determining whether the first bit is a certain bit value;

selecting a 16x16 parameter if the first bit is a certain bit value, and otherwise determining the 8x8 sub-block in which the data is located based on the Y and X indices;

determining whether the second bit corresponding to the 8x8 sub-block is a certain bit value;

selecting an 8x8 parameter if the second bit is a certain bit value, and otherwise determining the 4x4 sub-block in which the data is located based on the Y and X indices;

determining whether the third bit corresponding to the 4x4 sub-block is a certain bit value; and

selecting a 4x4 parameter if the third block is a certain bit value, and otherwise selecting a 2x2 parameter for the 2x2 sub-blocks of the 4x4 sub-block.

40. The method of claim 36, wherein selecting the appropriate quantization parameter comprises:

determining whether the first bit is a certain bit value;

selecting and storing a 16x16 parameter for the 16x16 block if the first bit is a certain bit value, and otherwise determining whether the quantization parameter is known for the data location within the data block;

determining the 8x8 sub-block in which the data is located based on the Y and X indices, if the quantization parameter is not known for the data location;

determining whether the second bit corresponding to the 8x8 sub-block is a certain bit value;

selecting and storing an 8x8 parameter for the 8x8 sub-block if the second bit is a certain bit value, and otherwise determining the 4x4 sub-block in which the data is located based on the Y and X indices;

determining whether the third bit corresponding to the 4x4 sub-block is a certain bit value; and

selecting and storing a 4x4 parameter for the 4x4 sub-block if the third block is a certain bit value, and otherwise selecting and storing a 2x2 parameter for the 2x2 sub-blocks of the 4x4 sub-block.

41. Apparatus comprising:

means for decoding address of data block into Y and X indices based on a Y and X index system;

means for receiving block size assignment information; and

means for selecting an appropriate quantization parameter based on the block size assignment information and the Y and X indices.

42. The apparatus of claim 41, wherein the data block is a 16x16 data block and wherein the block size assignment information comprises:

a first bit indicating whether the 16x16 data block is divided into 8x8 sub-blocks;

second bits if the first bit indicates that the 16x16 is divided into 8x8 sub-blocks, each second bit indicating whether a corresponding 8x8 sub-block is divided into 4x4 sub-blocks; and

third bits if at least one second bit indicates that the corresponding 8x8 sub-block is divided into 4x4 sub-blocks; each third bit indicating whether a corresponding 4x4 sub-block is divided into 2x2 sub-blocks.

43. The apparatus of claim 42, wherein the means for selecting the appropriate quantization parameter comprises:

means for determining a variable value based on the block size assignment information and the Y and X indices; and

means for selecting the quantization parameter based on the determined variable value.

44. The apparatus of claim 43, wherein the means for determining the variable value comprises:

determining a first value of the variable value as the first bit of the block size assignment information;

means for selecting one of the second bits of the block size assignment information as a second value of the variable value based on the Y and X indices, if the block size assignment information comprises second bits, and otherwise selecting a default value as the second value of the variable value; and

means for selecting one of the third bits of the block size assignment information as a third value of the variable value based on the Y and X indices, if the block size assignment information comprises third bits, and otherwise selecting a default value as the third value of the variable value.

45. The apparatus of claim 42, wherein the means for selecting the appropriate quantization parameter comprises:

means for determining whether the first bit is a certain bit value;

means for selecting a 16x16 parameter if the first bit is a certain bit value, and otherwise determining the 8x8 sub-block in which the data is located based on the Y and X indices;

means for determining whether the second bit corresponding to the 8x8 sub-block is a certain bit value;

means for selecting an 8x8 parameter if the second bit is a certain bit value, and otherwise determining the 4x4 sub-block in which the data is located based on the Y and X indices;

means for determining whether the third bit corresponding to the 4x4 sub-block is a certain bit value; and

means for selecting a 4x4 parameter if the third block is a certain bit value, and otherwise selecting a 2x2 parameter for the 2x2 sub-blocks of the 4x4 sub-block.

46. The apparatus of claim 42, wherein selecting the appropriate quantization parameter comprises:

means for determining whether the first bit is a certain bit value;

means for selecting and storing a 16x16 parameter for the 16x16 block if the first bit is a certain bit value, and otherwise determining whether the quantization parameter is known for the data location within the data block;

means for determining the 8x8 sub-block in which the data is located based on the Y and X indices, if the quantization parameter is not known for the data location;

means for determining whether the second bit corresponding to the 8x8 sub-block is a certain bit value;

means for selecting and storing an 8x8 parameter for the 8x8 sub-block if the second bit is a certain bit value, and otherwise determining the 4x4 sub-block in which the data is located based on the Y and X indices;

means for determining whether the third bit corresponding to the 4x4 sub-block is a certain bit value; and

means for selecting and storing a 4x4 parameter for the 4x4 sub-block if the third block is a certain bit value, and otherwise selecting and storing a 2x2 parameter for the 2x2 sub-blocks of the 4x4 sub-block.